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# PREPARATION OF BORON FLUORIDE BY THE ACID METHODS

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Submitted 20 March 1947

[A digest]

An 80 percent yield of $BF_3$ was obtained by the decomposition of a mixture of $KBF_4$ and a stoichometric quantity of $B_2O_3$ with a 200 percent excess of oleum at 180 degrees centigrade. Similar treatment of a mixture of $CaF_2$ and $B_2O_3$ at 180 degrees centigrade with a 50 percent excess of $B_2O_3$ and a 100 percent excess of oleum gave a 65 percent (or 15 percent lower) yield.

In the first process, $KBF_4$ was derived through the simple operations of precipitation, filtration, and drying; and the extremely troublesome operation of dehydrating $B_2O_3$ with the accompanying greater loss of expensive boric acid was almost eliminated. Cost of materials may be reduced further by the preparation of "fluoroboric acid" through the interaction of fluorite, boric acid, and dilute sulfuric acid.

[Collaborating with M. M. Slutskaya, Ryss, associated with the Laboratory of General Chemistry, Dnepropetrovsk Metallurgical Institute, previously published two articles on "The Rate of Formation of Tetrafluoroboric Acid in Mixtures of Hydrofluoric and Boric Acids"

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The first process proceeded with greater uniformity and less foaming than the second. Moreover, the removal of the "bisulfite" residue from the apparatus used for the reaction in the initial process can be performed more easily than the removal of the "gypsum" residue formed in the second.

Therefore, the first method is preferable to the second not only in laboratory research but also for technological purposes.

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